Progressive Meter System Architecture and Method

Inventor: Richard M. Mathis

The invention described here is a system well-known in the gaming industry as a progressive meter system.

Background of the Invention:

Generally and typically said systems consist of a central controller that communicates with nodes at each gaming machine or input device to which the system is connected. A progressive meter system may typically have a node or monitoring device in a gaming machine that reads data from said gaming machine and communicates said data to a central controller for processing of the data. Decisions made upon the basis of the data by said central controller are generally of a predetermined nature and may be of a type to encourage and enhance player participation. Payment of a large award (progressive jackpot) upon a game upon a gaming machine arriving at a predetermined outcome is a common function of a progressive meter system. Amount of said large progressive jackpot is typically derived by means of assigning a percentage of each coin played upon any gaming machine being attached to the progressive system (the progressive link) for summation into the progressive jackpot that is then prominently displayed to players to enhance the playing experience. A huge problem can arise if data accumulated at the central controller becomes corrupted or is lost; accordingly, typically, multiple copies of data reside upon the central controller and are checked against each other frequently. Generally and typically gaming jurisdictions require that any progressive jackpot displayed be available for win and that the probability of a winning outcome be the same from game to game on any gaming apparatus playing a progressive game. Consequently, display of a progressive jackpot available for win that is not correct (larger than actual value) can result in a large loss for an operator of gaming machines since many gaming jurisdictions will require that it be paid if won before the amount displayed can be adjusted downward.

There are three recognized categories into which a progressive meter system may be classified: stand-alone, link progressive and wide area progressive (WAP). A stand-alone progressive meter is connected only to a single gaming apparatus and performs its actions based solely upon data from the gaming apparatus to which it is connected. A link progressive system connects multiple gaming machines and data from all connected machines is processed at a central controller. A link progressive typically connects only machines that are locally present upon a gaming property. A wide area progressive (WAP) connects many gaming machines at many properties and may include local link progressive systems at properties connected to the WAP. An example of a WAP is Megabucks ® which is registered, owned and operated by International Game Technology.

Generally and typically link progressive meter systems and WAPs communicate with the central controller by means of conventional means and protocols. In the case of a link progressive system, communication is normally by means of some sort of serial data link. In the case of a WAP, communication with the central controller is generally by means of leased telecommunications lines or channels. Every effort is made to communicate a major event to the central controller as quickly as possible. Generally and typically said major event is the win of a large award by a player of a machine connected to the link progressive system, to the WAP or both. There is a great amount of concern that multiple games connected to a link could win a large progressive award simultaneously or at least within a few seconds of each other. Typically when a win of the progressive award occurs, the gaming apparatus attached to the link signals the central controller that the win has occurred, the gaming apparatus upon which the winning game was played is prevented from further play, the amount of award that is available for win by any other device connected to the link is adjusted to a predetermined amount (reset amount) and said reset amount is communicated by the central controller to all devices connected to the link. This procedure is common to all progressive meter systems. Payment of the large progressive win is normally made immediately to the player of the game that won the award.

Summary of the Invention:

The present invention involves a method of constructing a link progressive controller network of architecture such that no central or master controller is required. Each monitor connected to a gaming apparatus contains in computer data memory the entire status of the connected network. Additionally a method is illustrated for a bonus game connected to a gaming apparatus that may be played upon an individual gaming apparatus or upon a link progressive network.

Brief Description of the Drawings:

Fig. 1 shows a block diagram of a monitor of a gaming device as described in the present invention.

Fig. 2 shows a block diagram representation of a network of individual monitors of gaming apparatus.

Fig. 3 is a representation of a general parameter table that may be loaded into all monitors in a progressive meter network and a specific parameter table that may be loaded into a monitor included within a network

Fig. 4 is a representation of a sequence of play of a bonus game according to the present invention.

Fig. 5 is a representation of an award panel used in a gaming apparatus including a bonus game according to the present invention.

Fig. 6 is a flowchart representation of a portion of a program for purposes of updating current award amount that may run upon a monitor included within a progressive meter network.

Fig. 7 is a flowchart representation of a program flow for a portion of a program that may run upon a progressive meter network for purpose of resetting said link progressive network to a predetermined value.

Description of the Invention:

Consider a link progressive system that connects a plurality of monitors of gaming devices by means of a communication bus. Said communication bus may comprise a physical wire connection or may comprise wireless means such as radio frequency (RF), infrared (IR) or other means. Said monitors of gaming devices may be a device separate from a gaming apparatus or may be integrated into and be a part of said gaming apparatus. Each monitor is an intelligent device and comprises means for communicating with the gaming apparatus to which it is attached, means for decision making based upon calculated or predetermined conditions, means for communicating with other monitors to which it may be connected and means for communicating with peripherals that may be attached to enhance its function.

A block diagram of a monitor of a gaming device as described in the present invention may be as shown in **Fig.1**. Said monitor **20** may be comprised of a microcontroller **31**, a real time clock (RTC) **33**, a communications layer interface device **32**, a machine interface component **34**, a peripheral interface component **35**, and a local access port **36**. Microcontroller **31** may be an electronic chip or component comprising a microprocessor, program memory, a unique electronic identification, and data random access memory (RAM); said microcontroller may thus be a microcomputer capable of independently running a program stored in program memory, performing actions and making decisions as dictated by said program. Nonvolatile memory component (NVM) **30** provides means for permanent storage of data that may change and can be read and written by the microcontroller. Machine interface component **34** allows the monitor to establish electronic communication with a gaming machine with which it may be associated. Communications layer interface device **32** provides means for the monitor to communicate with other monitors in a distributed network. Real time clock **33** provides means to time synchronize the monitor with other monitor in any other network. Peripheral interface component **35** may provide means to communicate with devices such as in-game displays, progressive displays and other devices used to attract players and enhance player enjoyment. Local access port **36** may provide means to communicate with the monitor to obtain status information and to load a local parameter table **23** or to communicate with a central data gathering system.

Turning now to **Fig. 2**, which is a block diagram representation of a network of monitors **20**. Monitors **20A-20D** may all be in communication by means of a communications link **38**, but do not necessarily communicate in any set order; additionally there is no set number of monitors included in the network. There is no master monitor and there is no central controller; all monitors communicate upon a peer-to-peer basis. Said communications link may be any type of link well known in the art such as a hard-wired serial bus, RF, or infrared, but not limited to any of the aforesaid methods. When a monitor has an event to report, said monitor places said event in a predetermined format and communicates it to the network. Arbitration as to availability of the communications network connecting the monitors may be either by means of token passing or by means of monitoring electrical levels on the physical bus, as is done in the well-known protocol I2C or the well-known protocol termed Computer Area Network. Arbitration reduces or prevents collisions of data that may be caused by multiple devices attempting to transmit a message upon the network simultaneously.

Fig. 2 illustrates at **40** connection of a monitor by means of **35** to an external peripheral **40**; said peripheral may be, but not limited to, a progressive meter display, audio attraction device, etc. A block representation of external communication with the progressive meter network is provided at **41**; which may be, but is not limited to, a portable device or network computer device communicating with the progressive meter network.

Turning now to **Fig.3**, which is a representation of a general parameter table **22** that may be loaded into all monitors in a progressive meter network and a specific parameter table **23** that may be loaded into a monitor included within a network. Said general parameter table provides common bounds which may be utilized by a program running on microcontroller **31** of any monitor included in a network to perform desired actions. Said specific parameter table provides means for the program running within a monitor to perform desired actions specific to the device to which the monitor is connected. The specific parameter table may be different for each monitor included within the progressive meter network.

Examining more closely specific parameter table **23;** positions in microcontroller **31** nonvolatile memory may be assigned, but not limited to, to coin-in-buffer **52**, percent-

to-progressive **54**, denomination of gaming apparatus **56,** percent-to-bonus pool **58** and security parameters **60**. Aforesaid parameters are dependent upon a specific gaming apparatus that communicates with a particular monitor **20**. The parameters may be different for each monitor.

Examining more closely general parameter table **22**, positions in microcontroller **31** nonvolatile memory may be assigned, but not limited to, total jackpot amount to be displayed **42**, reset amount to be displayed **44**, backup amount to start a display from **46**, bonus pool **48**, win parameters **50**, and public key **51**. The parameters may be the same for each monitor.

A simple example of operation of a progressive meter network according to the present invention is as follows:

Assume a total jackpot amount to be displayed to be 1000. Said amount is common to all nodes included within the network. Assume that a coin-in-buffer amount of 1 is present in a specific parameter table of a monitor. Said monitor checks to see that a coin-in-buffer is greater than a specific amount, sums the amount in the coin in buffer with the jackpot amount to be displayed and waits for the network traffic to be clear at which point the jackpot amount to be displayed is transmitted to the entire network. The transmitting monitor waits for an acknowledgement from any other monitor on the network and when said acknowledgement is received clears its coin-in buffer to zero. Total jackpot amount to be displayed **42** is replaced by the jackpot amount just received in general parameter table **22** in all connected monitors which causes total jackpot available for win to be updated among all monitors connected to a network. A backup coin-in buffer may be included in the monitor microcontroller memory structure to allow for a long time between transmission and an acknowledgement. Said backup coin-in buffer will alternate position with the coin-in buffer as the active coin-in buffer. If multiple coins accrue in the coin-in-buffer, the amount is summed and the monitor waits for a transmission slot on the network. If there is no traffic on the network for a specific period of time, monitors generate random "I'm here" transmissions for purpose of assuring that the network is connected to all monitors. If, after a predetermined amount of time elapses, a monitor does not receive any communication from any device the program assumes that it is off the network and it may enter the stand-alone progressive

mode with a new set of program rules or it may simply shut down any display functions it may have.

In another example, assume that a progressive jackpot is hit at a particular gaming machine included in a progressive meter network according to the present invention. An electronic signal will be sent by said gaming machine to a monitor attached to it and will be received and interpreted by said monitor. The monitor will send an electronic data packet onto the progressive system network that will be interpreted by all included monitors as a jackpot signal and program running on microcontrollers included in the monitors will cause total jackpot amount to be displayed **42** to be overwritten with a current value that is in reset amount to be displayed **44**. Said value in reset amount to be displayed as modified by predetermined or calculated values as determined by the program running within the monitors will become the new maximum award value that is available for win by a player playing a gaming apparatus included within the progressive meter network. A central controller is neither utilized nor is it required in the progressive meter network of the present invention. Communication with a central data gathering system for audit purposes, for change of program parameters of the program running at each monitor or even for change of program running at each monitor may be by means of local access port **36**.

Turning now to **Fig. 6**, which is a flowchart representation of a portion of a program for purposes of updating current award amount that may run upon a monitor included within a progressive meter network of the present invention; said program begins at **86** where initialization of parameters is performed and proceeds to **88** where the program monitors said progressive meter network communication layer **38**, for incoming data or to determine if said monitor can transmit data without colliding with a data stream from another connected monitor that is currently transmitting. If no traffic is present upon said communication layer, the program continues to **112** to check status of a delay buffer that may contain a period of time to delay transmitting data if the communication layer is clear. If, at **112**, no delay prior to transmitting data is indicated, the program proceeds to check a flag at **116** that indicates that data is available to be transmitted and, if said flag is not set, the program returns to **88**. If the flag indicating that data is available to be transmitted is set, the program proceeds to **118** where updated general

parameter table **22** is transmitted and transmit delay is set to greater than, or equal to, one for purpose of allowing reception of an acknowledge by another monitor on the progressive meter network. Program returns to **88** and, if no transmission is detected upon the network communication layer, will wait a predetermined period time before transmitting again since the transmission delay buffer, which is decremented at **114**, is not equal to zero at **112**. If, at **88**, data is present upon the communication layer the program proceeds to **92** where a check is made to see if data has just recently been transmitted and, if no transmission occurred recently, the program proceeds to **124** where data equal to current award amount (current jackpot amount) is read from the general parameter table and transmitted to any local peripherals by means **35** and the program continues to **126** where a determination of whether any bets (coin-in) were placed upon a gaming apparatus to which the monitor running the program is attached during time the program was monitoring the communication layer. If no bets were placed, the program returns to **88**, if bets were placed, the program continues to **122** where a new progressive jackpot amount is calculated; program continues to **120** where a flag is set to cause the program transmit data onto the communication layer and a delay buffer is loaded to cause the program to look for a response to a transmission of the general parameter table that the program will cause to be made. The program proceeds to **88**, transmits the general parameter table with updated information and, if the delay buffer is not equal to zero, waits for a response prior to transmitting data again. If a response is received, said response is parsed at **94** to determine if it is an ACK which indicates a good transmission was received upon the progressive meter network and if data received does not indicate that good data was received, the program proceeds back to **88** to wait for indication of good data or a timeout of time to listen. If an indication of a good transmission is received at **94**, the program continues to **96** where a determination is made of whether a record of bets placed upon the gaming apparatus were placed into a primary or secondary buffer location; if placed into primary location, said primary location is cleared at **98** and if placed into a secondary location, said secondary location is cleared at **100**. The program continues to **102** where a pointer is adjusted to point to the active record of bets is stored while the program is performing the aforesaid steps, the program continues to **104** where a flag that causes the program to transmit onto the communication layer is

disabled, transmit delay buffer is cleared at **106** and the program continues on to **108** where a buffer is updated with a number of coins that may have been bet upon the gaming apparatus while the program was performing the aforesaid steps. Program exits at **110**.

Aforesaid explanation of a program segment illustrates a principle that may be applied to any other dynamic data upon a progressive meter network according to the present invention:

1) Multiple sets of data are maintained and while one set of data is being employed to update a field in the general parameter table, another set of data is being updated by a program running on the monitor so as to assure that no monitored event is missed.
2) A monitor transmits a copy of the updated general parameter table and waits for a response from other monitors included within the progressive meter network. Any monitor may respond to a received message in one preferred embodiment.
3) In one version of a preferred embodiment, all monitors are assumed to have received a message if one monitor receives a message since all monitors are attached to the progressive meter network. A well-known example of a network of the type described is I2C or Computer Area Network.
4) In a preferred embodiment of a network that employs token passing, the updated general parameter table may be passed as a token to another monitor and will receive a response that said other monitor has received the updated general parameter table in good order.
5) In both preferred embodiments the general parameter table is updated by each monitor to reflect all activity upon all monitors included within the progressive meter network and, thus, accurate data is available to all monitors within an infinitesimally small period of time. Yet, no central controller is required.

A flowchart representation of a portion of a computer program that may be running upon a monitor for purposes of counting bet amounts according to the present invention is shown in **Fig. 6** and begins at **128**. Said computer program segment is of a type generally classified as an interrupt service routine (ISR) and is generally invoked when an event, a coin bet in this case, interrupts normal program flow; part

of which may be aforesaid flowchart beginning at **86**. From **128**, the program proceeds to **130**, where verification that a bet was really recorded; if no bet was recorded, program exits at **148** and if said bet was recorded, program continues to **132** where a flag is checked to record the bet in the active buffer at **136** or **138**. Program then continues to **140** where communication layer **38** of the progressive meter network is scanned for activity and, if no activity is detected, the program exits at **148**. If activity upon said communication layer is detected at **140**, the program continues to **142** where a flag location is checked to see if the program is already causing data to be transmitted and, if data is being transmitted, the program exits at **148**; if data is not being transmitted, the program continues to **142** where provision is made to prepare to transmit data just gathered. At **143** a flag is adjusted to direct any further data gathered to be placed into another buffer, program continues to **144** where bet data is summed with any previously gathered bet data not previously transmitted, program continues to **146** where a flag is set to cause data to be transmitted by the main program running on the monitor and program exits at **148**.

If electrical power to the progressive meter network is interrupted, data in the general parameter table of each monitor is saved in nonvolatile memory. Upon resumption of electrical power, a voting procedure may occur between all of the monitors included within the progressive meter network and all general parameter tables will be adjusted to the values that existed prior to interruption of power. Chance of recovery of general parameter values prior to a power outage is increased greatly by a system as described in the present invention over chance of recovery of general parameter values in a generally known system that operates from a central controller. A system employing a central controller typically includes only several copies of general parameter values and all said parameter values are stored in one location. In the present invention there are as many copies of the general parameter table as there are monitors included on the system and each monitor may include multiple copies of the general parameter table.

Security in the progressive meter network of the present invention is much greater than security in generally known progressive meter networks. Transmission of data on serial communication bus **38** may be encoded. Said encoding and decoding may be by means of public key **51** and security parameters **60** or by other well-known means.

Security parameters may also include a unique electronic identification number for each monitor included within the progressive meter network. A monitor may not be included upon the progressive meter network unless predetermined authentication procedures have been performed. A monitor that has not been properly authenticated will be ignored and may not participate in the operation of the progressive meter network. All monitors may gather and store information concerning certain memory and operational checks of all other monitors included upon a progressive meter network, said information may be stored in nonvolatile memory location **60**. At random or predetermined times such as transmission of an "I'm here" sequence previously described, monitors may crosscheck security information of other monitors upon the progressive meter network. If a monitor does not contain security information that was previously authenticated to the other monitors upon the progressive meter network and has not specifically been authorized to the network to have different security information by performance of a predetermined authentication sequence, said monitor may be excluded from participation on the progressive meter network and may enter a standalone mode of operation. In a worst case, all monitors may enter said standalone operational mode until a predetermined authorization action is performed. Aforesaid manner of operation reduces an operator of games exposure to having an intentional security breaches and players falsely claiming a large monetary award.

Consider now a wide area progressive network (WAP) including the principles of the present invention described previously. Real time clock **33** included within monitor unit **20** may be a very precise oscillator or may be synchronized with a time standard such as a time standard provided by the U.S. Naval Observatory or a local time standard may be implemented in one location and a time synchronization signal transmitted on the progressive meter network. An example of a precise oscillator that could be used for a local time standard is a Datum X72 rubidium oscillator manufactured by Datum of Irvine, California. Said precise oscillator is exceptionally stable and has a stability and resolution that is in the order of Pico seconds. The rubidium oscillator is also cost effective and can be easily included upon a modern circuit board.

Coordination and tracking of events upon a WAP is generally accomplished by means of leased lines and depends upon speed of communication to assure

synchronization of sites included within said WAP. The present invention eliminates need for very rapid communication with a central site and instead synchronizes events between participants upon the network by means of a very precise time base. Another advantage of precise time signal availability upon any progressive network is that a timestamp of a major event, such as win of a large award, may be accomplished. Measurement of time of occurrence of said event even within precision of 1 millisecond allows resolution of multiple events occurring nearly simultaneously. Generally and typically present progressive meter systems do not have a method of precisely determining time of occurrence of an event that may cause payment of a large award. Should a second event identical to the first event occur upon a second gaming apparatus connected to a present-day progressive network and said second event occur in less than 1 or 2 seconds, there is no way of determining which player really won maximum award displayed and which player should receive the award equal to the meter reset value. In situations such as just described, generally an argument ensues and the maximum award is split between "simultaneous" winners or each player of a winning game receives the full amount of the maximum award. In certain cases lawsuits to determine distribution of maximum award follow.

The present invention solves the problem just described by availability of a precise time signal to all monitors included within the progressive meter system. When a major event, such as win of maximum award displayed occurs, a time of occurrence precise at least to microseconds is stored by a monitor connected to a gaming apparatus upon which said win was generated. Said monitor transmits data to its connected network to indicate that a win of maximum award has occurred and a reset of all amounts available for win displayed is adjusted to a reset amount **44** in the general parameter table of all monitors. If a win of maximum award occurs, or has occurred, prior to reset being accomplished, timestamps corresponding to each event are compared by the monitors connected to each apparatus indicating said win and resolution of an amount of award to be given to each winning player can be easily accomplished with no human intervention.

Presently a return to display of a reset amount available for win by a plurality of devices included within a progressive network is a matter of concern. There is always a concern upon the part of an operator that said reset amount may not be displayed quickly

after a reset has occurred and that another player may make a claim for a larger amount previously displayed. The situation just described is especially of concern in a WAP and is of no concern if the method of timestamps as described in the present invention is employed in a link progressive system confined to one location. Concern of simultaneous win of a maximum award displayed is warranted due to speed of communication with all sites connected to said WAP. The present invention proposes a solution to the problem of slow communications between elements of a WAP by implementing a novel reset sequence. Said reset sequence may also be applied to a local link progressive, especially to a link progressive that is implemented with a central controller.

Assume a link progressive network comprised of a total number of gaming devices equal to n. All of said devices have an equal probability p of winning a maximum award amount for every game played. For simultaneous play the probability q that said maximum award would be won is $q = (np)$. A portion of said total number of gaming devices may be allocated to each location on a WAP or link progressive. Communications speed may not be of great concern as to simultaneous win of a maximum award and attendant problems as discussed previously if reset of an award is performed in a following manner:

1) Top award is won.
2) All gaming apparatus attached to local link are reset to and display a predetermined reset amount that is now available for win. Winning machine is locked out awaiting payment.
3) A notification is sent to all sites on the WAP that a win of maximum award has occurred.
4) All sites on the WAP reset the connected local link and the maximum award available for win is adjusted to and displays a predetermined reset amount.

The sequence described above is as is generally and typically performed now, but there are some differences performed at each step. Actual maximum award available (MaxJackpot) for win is multiplied by a factor to account for an operator's confidence that simultaneous jackpots will not occur. As an example assume 0.50 which allows for occurrence of two simultaneous jackpots. Maximum award available for a winning game

would be (MaxJackpot)(0.50) and this is the amount that would be displayed to players and would be total jackpot amount to be displayed **42**. MaxJackpot (0.5) would be placed in a pool called BackJack and will continue to increase as the maximum award increases as calculated by the formula just given. Typically odds of winning a maximum award available on a WAP are very small, and with a large number of machines included, said maximum award grows rapidly. When win of a maximum award occurs, all maximum awards on the local link progressive network in which a winning game participates reset to and display a predetermined reset amount. If there are a number of machines in said local link progressive network equal to A, then probability that a second jackpot could occur and be counted as a simultaneous jackpot since other sites on the WAP have not been notified to reset the maximum jackpot amount is
$q = (n-A)p)$ for simultaneous play of all machines. Decreased odds that a jackpot will be hit and counted as a simultaneous jackpot for pay purposes may be taken into account and some funds in BackJack may be released to the winning player. Said released funds can be released slowly and cause a win amount for the winning player to grow incrementally. As more sites connected to the WAP are reset to the predetermined reset amount, confidence that a simultaneous jackpot will not occur increases and more funds can be released from BackJack to the jackpot. Maximum benefit from this approach occurs if all progressive link networks included within a WAP can be set to the reset amount prior to all funds being taken from the first release of funds from BackJack to the first winning player. If reset occurs at all progressive link networks included on the WAP then an operator of games is assured that no claim for a simultaneous jackpot can occur and can release all funds in BackJack to the winning player.

Turning now to **Fig. 7**, which is a flowchart representation of a program flow for a portion of a program that may run upon a WAP or progressive meter network; said flowchart is an illustration of a method for reset to start value of link progressive system. Program begins at **150** and continues to **152** to see if a maximum award has been won, if no maximum award has been won, program exits at **166**; if a maximum award has been won, program continues to **154** where an incremental pay is started of said maximum award as displayed upon all systems included in said WAP or progressive meter network. The maximum award may be shown to players as being only a portion of actual

maximum award that is available. Pay procedure at **154** may be such that a period of time elapses, as pay is incremented toward a final value that will be paid to a winner of the maximum award. Said period of time is valuable to operation of the WAP to allow communication between all points included upon the WAP to be notified that a maximum award has been won and that all points should reset displayed amount available for win to a predetermined reset value. Program continues to **156** where determination of payment of maximum award is made and, if entire award available has been paid, the program exits a **166**; if payment of maximum award has not been completed, then the program continues to **158** where a determination is made of number of gaming apparatus included in the WAP that have been notified of the win of maximum award and reset. The program continues to **160** where a calculation of probability of a win on a gaming apparatus that has not been reset is made, and if said probability of a win is greater than a predetermined threshold probability, the program returns to **154**. If the probability of a win is less than said predetermined threshold probability, the program continues to **164** where another portion of an incremental payout is added to the maximum award currently being paid out; program then continues to **154**. The aforesaid procedure has an effect of creating a constantly increasing visual display of an amount to be paid to a winning player. Entire amount of the actual maximum award may be made to said winning player with the effect that the player is paid substantially more than he originally was notified he would win. Additionally the award is displayed as increasing over a time period, which enhances player suspense and enjoyment and also allows all machines on the WAP to be reset and prevent exposure of an operator to possibility that multiple wins of the same maximum award may be made simultaneously.

Turning now to **Fig. 4**, which is a representation of an auxiliary (bonus) game that may be played upon a link progressive network or upon a standalone progressive. In the present invention a member of a link progressive may participate in the link progressive game and/or play a standalone game of its own. Said auxiliary game that will be described is designed to be played upon what is generally known as an in-game meter, which is typically a display that is placed into a gaming apparatus for purpose of showing an amount available for a win of a progressive prize. The auxiliary game is designed to provide interaction with a player of a gaming machine and to have no dependence upon

the outcome of a primary game played upon said gaming machine. A listing of actions as the auxiliary game proceeds may be as follows:

1) If auxiliary game is completed, clear the display as illustrated in **62**.
2) If a maximum bet has been made for the game played upon the gaming apparatus, draw a random number.
3) In accordance with a method described in U.S. Pat. No. 5,380,008, U.S. Pat. No. 6,053,813 or any other well-known method of random symbol selection, compare said random number drawn in step 2 to determine a symbol to draw.
4) Store said symbol drawn in (3).
5) Display a generic icon on the display as illustrated in **64**.
6) Continue steps 2 – 5 until a predetermined number of maximum bet games have been played upon the gaming apparatus. As illustrated in **66**, said predetermined number of maximum bet games is 5, but this is not a limitation otherwise.
7) Upon next maximum bet game played upon the gaming apparatus to which the in-game meter is attached, display all symbols drawn in (3) in order. A representation of said display is in **68**.
8) Accrue any award due the player in a nonvolatile memory location in the monitor attached to the gaming apparatus. An example of a winning display is illustrated in **70** and an example of a losing display is illustrated in **72**.
9) Return to (1) and begin the described sequence again.

A total of a player's accrued winnings due to aforesaid auxiliary game sequence may be displayed as illustrated in **74**. No dependence upon a game being played upon a gaming apparatus to which aforesaid auxiliary game is attached is required except for a predetermined knowledge of how many coins constitute a maximum coin bet. A player may collect his winnings from the auxiliary game just described by means of a secure radio frequency transponder that in a preferred embodiment may be a component of a TIRIS series manufactured by Texas Instruments. In **FIG. 2** peripheral device **41** may be a reader module of type RI-STU-MRD1 manufactured by Texas Instruments. Payment for winnings occurs at a casino cash cage at which said secure radio frequency transponder is read, winnings are converted into cash-to-player and the radio frequency

transponder is reset to zero. No dependence upon the gaming apparatus to which the auxiliary game is attached is required for payment of winnings.

The auxiliary game just described increases player enjoyment since it costs a player no visible deduction from his bet, nor does it require any attention to play on the part of the player. It is just a bonus game at which a player can win a substantial amount. An operator of a gaming machine may adjust the hold of the gaming apparatus onto which the auxiliary game just described is installed to be that of a standalone progressive or in any other manner, as operational philosophy requires.

Turning now to **FIG. 5**, which is representation of an award panel **76** commonly used in a gaming apparatus; a normal award table or pay table as is generally employed in said gaming apparatus is represented by **78**, an in-game display **80** may be used to display auxiliary game symbols as they are drawn according to each game, rules of the game **82** may be as posted and inform a player as to how the auxiliary game is played, award table for the in-game meter **84** may be as shown. No change is made to said award table for accommodation of the auxiliary game and consequently minimal time should be required in jurisdictional technical approval of the auxiliary game.

The auxiliary game played standalone upon the in-game meter previously described may also be played upon a link progressive network. A progressive meter network of the type described in the present invention is particularly advantageous. The auxiliary game as described previously may be operating upon any gaming apparatus included within the link progressive network. As many instances of the auxiliary game may be played as an operator of the progressive meter link allows. One method of playing the auxiliary game previously described is to have a monitor generate a random number and map said random number to an electronic identification number of a monitor on the progressive meter network (selected monitor). If said selected monitor is attached to a gaming apparatus that is actively being played a flag is set in miscellaneous game parameters **59** of specific parameter table **23** and it is transmitted to the link progressive network, all monitors included in the network will receive said specific parameter table, but only a monitor whose electronic identification matches an identification in the specific parameter table will act upon said flag. Said monitor that has a matching identification will begin an auxiliary game similar to the standalone game previously

described, but will prompt a player at the connected gaming apparatus that only a predetermined amount of time is available for playing said auxiliary game. When the auxiliary game played on the in-game meter is complete or time-out has occurred, the monitor at the connected gaming apparatus generates a random number to select another monitor to play the auxiliary game and transmits a packet onto the progressive meter network. Multiple instances of the auxiliary game previously described can be running simultaneously upon the progressive meter network since each instance is generated and controlled by a monitor attached to a gaming apparatus that is being played.

Description of a Preferred Embodiment:

In one preferred embodiment of a monitor **20**, microcontroller **31** may be of a type DS89C420 manufactured by Dallas Semiconductor, machine interface **34** and peripheral interface **35** may be of a type MAX488E manufactured by Maxim, command access port **36** may be of type MAX221E and a MAX488E manufactured by Maxim, RTC **33** may be of a type DS1305 manufactured by Dallas Semiconductor, nonvolatile memory **30** may be of a type STK12C68 manufactured by Simtek and bus communication layer interface **32** may be of a type UC5350 or SN65HVD251 manufactured by Texas Instruments. All components included within said preferred embodiment are familiar to one skilled in the art and connecting them in a manner to realize a monitor as described herein will be obvious. In another preferred embodiment of a monitor, an in-game progressive meter as manufactured by Aurora Enterprises may be employed. A program including elements of a flowchart described in **Fig. 6** may be loaded into program memory of said progressive meter and numerous in-game meters running said program may be interconnected as shown in **Fig. 2** to construct a progressive meter system of the present invention.

A preferred embodiment of the auxiliary standalone game described may be an Aurora Enterprises in-game progressive meter. Said progressive meter includes a microprocessor, nonvolatile data memory, program memory and a method to communicate with a gaming apparatus and a serial system bus. Program memory may be